Database Systems I

Lab – Join of Tables

Department of Information Technology
Database Systems I (IT215)
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MySQL

Join: Querying Data from Multiple Tables

- Sometimes the desired information can be retrieved from a single table, but usually you need to get the desired data from more than one table. In such cases, we join tables to get the desired data.
- There are three types of joins:
  - **Cross** Join
  - **Inner** Join → The most commonly used **SQL JOIN**.
  - **Outer** Join

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Inner Join SQL Syntax

```
SELECT   A1, A2, ... , An
FROM     r1, r2
WHERE    r1. Foreign_key = r2. Primary_key;
```

OR

```
SELECT   A1, A2, ... , An
FROM     r1  INNER JOIN  r2
         ON   r1.Foreign_key = r2.Primary_key;
```

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Join (Example 1)

- Write an SQL query to get the **names** of those teachers <u>who teach classes on Monday or Sunday</u>.

Class

classCode	teacherID	classDay	room	deptName
B226	BI01	Monday	4211	Biology
C126	CS03	Monday	9311	Computer Science
C321	CS03	Sunday	9308	Computer Science
C413	CS02	Tuesday	9308	Computer Science
C416	CS03	Thursday	9311	Computer Science
E227	EN01	Thursday	1206	English
E314	EN03	Monday	1204	English
E414	EN03	Sunday	1210	English
H115	HI01	Sunday	2108	History
M235	MA01	Thursday	5204	Mathematics
M425	MA01	Monday	5210	Mathematics
S226	SP02	Tuesday	1304	Sport

Teacher

teacherID	teacherName	deptName	teacherRank
BI01	Adams	Biology	Lecturer
CS01	Byrne	Computer Science	Assistant Prof
CS02	Smith	Computer Science	Assistant Lec
CS03	John	Computer Science	Lecturer
EN01	Smith	English	Professor
EN02	Leonardo	English	Assistant Lec
EN03	Kate	English	Lecturer
HI01	Kim	History	Assistant Prof
MA01	Julia	Mathematics	Assistant Lec
SP01	Maria	Sport	Professor
SP02	Sarah	Sport	Lecturer

Join (Example 1) - Answer

- Write an SQL query to get the **names** of those teachers who teach classes on Monday or Sunday.

```
select distinct teacherName
from teacher, class
where teacher.teacherID = class.teacherID and
      classDay in ('Monday','Sunday');
```

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Join (Example 2)

- Write an SQL query to get the **full name** and **major** of those students whose grade in any class is less than 50.

Student

stuID	lastName	firstName	major	credits
S1001	Smith	Tom	History	90
S1002	Chin	Ann	Mathematics	36
S1004	Smith	Jack	English	75
S1005	Lee	Perry	History	3
S1007	Streep	Sarah	English	81
S1010	Burns	Edward	Biology	63
S1011	Roberts	Mike	English	66
S1012	Damon	Tom	Computer Science	90
S1013	McCarthy	Owen	Mathematics	27
S1015	Jones	Mary	Sport	42
S1017	Ford	Jennifer	History	45
S1018	Nolan	Ryan	English	50
S1020	Rivera	Jane	Computer Science	15

Enroll

stuID	classCode	grade
S1002	M235	76.00
S1004	E227	50.00
S1005	H115	93.00
S1007	E227	82.00
S1007	E414	71.25
S1010	B226	75.00
S1011	E227	33.00
S1011	E314	57.50
S1012	C413	60.00
S1012	C416	50.50
S1013	M235	90.00
S1015	S226	88.70
S1017	H115	79.00
S1020	C321	40.00
S1020	C413	45.00
S1020	C416	48.00

Join (Example 2) – Answer

- Write an SQL query to get the **full name** and **major** of those students whose grade in any class is less than 50.

```
select distinct firstName, lastName, major
from student, enroll
where student.stuID = enroll.stuID and grade<50;
```

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Join (Example 3)

- Write a query to find the **ID** and **grade** of all students who enrolled in any class taught by a teacher whose ID is EN01. Arrange the results in descending order of students' grades.

Class

classCode	teacherID	classDay	room	deptName
B226	BI01	Monday	4211	Biology
C126	CS03	Monday	9311	Computer Science
C321	CS03	Sunday	9308	Computer Science
C413	CS02	Tuesday	9308	Computer Science
C416	CS03	Thursday	9311	Computer Science
E227	EN01	Thursday	1206	English
E314	EN03	Monday	1204	English
E414	EN03	Sunday	1210	English
H115	HI01	Sunday	2108	History
M235	MA01	Thursday	5204	Mathematics
M425	MA01	Monday	5210	Mathematics
S226	SP02	Tuesday	1304	Sport

Enroll

stuID	classCode	grade
S1002	M235	76.00
S1004	E227	50.00
S1005	H115	93.00
S1007	E227	82.00
S1007	E414	71.25
S1010	B226	75.00
S1011	E227	33.00
S1011	E314	57.50
S1012	C413	60.00
S1012	C416	50.50
S1013	M235	90.00
S1015	S226	88.70
S1017	H115	79.00
S1020	C321	40.00
S1020	C413	45.00
S1020	C416	48.00

Join (Example 3) – Answer

- Write a query to find the **ID** and **grade** of all students who enrolled in any class taught by a teacher whose ID is EN01. Arrange the results in descending order of students' grades.

```
select stuID, grade
from class, enroll
where class.classCode = enroll.classCode and teacherID = 'EN01'
order by grade DESC;
```

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Join (Example 4)

- Write a query to find the **ID** and **name** of teachers whose classes are held in **room 9308**. Arrange the results in alphabetic order of teachers' names.

Class

classCode	teacherID	classDay	room	deptName
B226	BI01	Monday	4211	Biology
C126	CS03	Monday	9311	Computer Science
C321	CS03	Sunday	9308	Computer Science
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C416	CS03	Thursday	9311	Computer Science
E227	EN01	Thursday	1206	English
E314	EN03	Monday	1204	English
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EN02	Leonardo	English	Assistant Lec
EN03	Kate	English	Lecturer
HI01	Kim	History	Assistant Prof
MA01	Julia	Mathematics	Assistant Lec
SP01	Maria	Sport	Professor
SP02	Sarah	Sport	Lecturer

Join (Example 4) – Answer

- Write a query to find the **ID** and **name** of teachers whose classes are held in **room 9308**. Arrange the results in alphabetic order of teachers' names.

```
select teacher.teacherID, teacherName
from teacher, class
where teacher.teacherID = class.teacherID and room = 9308
order by teacherName;
```

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